

# Causes and Effects of Internet Gaming Addiction among Adolescents by a Case Study in China

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**Abstract:** In recent times, internet gaming addiction has become a significant concern among adolescents. This study investigates the causes and consequences of internet gaming addiction using a correlational study method and structural equation modeling to analyze the data. Six hypotheses were generated for the model. Data was collected using various instruments proven reliable and valid by previous studies, with 276 teenage students participating in the study. The antecedent variables include gender, healthy relationship behaviors computer gaming, and frequency of gaming. The consequence variables are grade point average (GPA), self-esteem, and self-confidence. The results indicate computer gaming increase internet gaming addiction, whereas being female and people with healthy relationship profiles are less likely to develop problematic patterns internet gaming addiction. Regarding the consequences, internet gaming addiction significantly decreases GPA and self-esteem but does not significantly influence self-confidence. Further research studies and implications are presented and discussed.

**Keywords:** Internet Gaming Addiction; Self-confidence; Self-esteem; Academic Performance; Adolescents.

## 1. Introduction

The advent of the internet and digital gaming has revolutionized leisure activities among adolescents. As these technologies became more accessible, concerns have emerged regarding their potential for addiction and the subsequent impact on various aspects of young individuals' lives (Caplan, Williams & Yee, 2009). Internet gaming addiction has garnered significant attention due to its prevalence and potential negative consequences on adolescents' academic performance, psychological well-being, and social relationships (Caplan, S. E., 2003).

The phenomenon of internet gaming addiction can be conceptualized as a behavioral addiction characterized by excessive and compulsive use of online games, leading to significant impairment or distress (Charlton & Danforth, 2007). Various terms such as "internet addiction disorder," "problematic internet use," and "compulsive internet use" have been employed to describe this condition, reflecting its multifaceted nature and the diverse perspectives within the literature (American Psychiatric Association, 2013).

Research has identified a range of antecedents contributing to the development of gaming addiction. Factors such as gender and social relationships situations play a significant role (Bornstein, et al., 2002). Additionally, behavioral patterns like the use of the internet for leisure activities and engagement in other addictive behaviors such as smoking have been linked to heightened addiction tendencies (Greenberg et al., 2010).

The consequences of internet gaming addiction are profound, extending beyond the realm of personal health to affect academic and social domains. Adolescents suffering from gaming addiction often experience a decline in academic performance, self-esteem, and self-confidence. These issues are compounded by poor interpersonal relationships and neglect of daily responsibilities, further exacerbating the negative impact on their overall development and well-being.

In examining these dynamics, this paper synthesizes findings on internet gaming addiction among adolescents. By exploring both the antecedents and consequences of this

condition, we aim to provide a holistic understanding of the factors contributing to its development and the implications for affected individuals. Through this analysis, we seek to inform parents, educators, and policymakers about the critical need for targeted interventions to mitigate the adverse effects of internet gaming addiction and promote healthier engagement with digital technologies.

## 2. Hypotheses

### 2.1. Causes of Internet Gaming Addiction

Gender, leisure activities, and social relationship behaviors are explored as factors contributing to Internet Gaming Addiction.

#### 2.1.1. Hypothesis 1. Males are More Susceptible to Internet Gaming Addiction. (H1)

Research consistently shows that males are more susceptible to internet gaming addiction than females, with significant gender differences in engagement levels, age of onset, and addiction prevalence to video-arcade and computer games (Thomas & Martin, 2010). Studies indicate that internet gaming addiction is particularly problematic among adolescent and young adult males. For instance, among massively multiplayer online role-playing games (MMORPG) players, males are overwhelmingly dominant, as shown by self-selected samples where up to 85% of players are male (Griffiths, Davies & Chappell, 2003). The gender disparity in gaming addiction may be due to various factors, including marketing strategies that target males, social pressures that discourage female participation in gaming, and physical factors that make gaming equipment less accessible to women (Cruea and Park, 2012). Consequently, interventions to prevent Internet gaming addiction should particularly focus on boys.

#### 2.1.2. Hypothesis 2: Computer Gaming as a Leisure Activity Increases Internet Gaming Addiction. (H2)

Previous research indicates that both online and offline computer games have higher rates of lifetime participation, frequency, duration of play, and addiction prevalence compared to video arcade games, with online games showing

the highest addiction rates. Moreover, computer games, whether online or offline, are more popular among high school students than university students (Thomas & Martin, 2010).

Grüsser et al. (2006) suggested that excessive computer gaming may lead to internet gaming addiction, particularly when it starts to replace other leisure activities. Rehbein et al. (2010) further linked video game dependency to psychological and social stress, including lower academic performance, reduced sleep, fewer leisure activities, increased school absenteeism, and even suicidal thoughts. This study, therefore, focuses on exploring the connection between internet gaming addiction and frequent computer gaming as a leisure activity, which is often preferred over activities like sports and socializing with friends.

### 2.1.3. Hypothesis 3: Maintaining Healthy Relationships with Family, Friends, and Teachers Decreases Internet Gaming Addiction. (H3)

Excessive internet usage can severely impact an individual's social, occupational, and daily functioning, leading to persistent addictive behaviors. According to Milani (2018), quality of teacher relations emerged as a potential protective factor for internet gaming addiction. Internet addiction may arise from or exacerbate familial discord; individuals facing family issues sometimes seek refuge on the internet to escape conflicts (Beard, 2005). Consequently, internet addiction can both result from and contribute to various interpersonal challenges. Numerous studies underscore a reciprocal link between negative family dynamics and internet addiction.

## 2.2. Effects of Internet Gaming Addiction

The significant amount of time some individuals spend playing computer games and online games has raised concerns and attracted the curiosity of researchers. Excessive online gaming can lead to several negative outcomes, including decreases in academic performance, self-confidence, and self-esteem.

### 2.2.1. Hypothesis 4: Internet Gaming Addiction Negatively Impacts Academic Performance. (H4)

Numerous studies highlight a significant inverse relationship between severe video game addiction and academic success. Anderson and Dill (2000) found that increased gaming time is linked to lower academic achievement, while exposure to violent video games negatively impacts school performance (Gentile et al., 2004; Lynch et al., 2001). However, some research contradicts these findings. Borzekowski and Robinson (2005) reported no significant correlation between gaming frequency and academic performance. Additionally, Durkin and Barber (2002) and Mitchell and Savill-Smith (2004) argued that typical gaming time is insufficient to harm academics and that complex games may even enhance cognitive and strategic skills.

### 2.2.2. Hypothesis 5: Internet Gaming Addiction Decreases Self-confidence. (H5)

Previous studies have examined how traits like shyness, anxiety, loneliness, depression, and self-consciousness impact Internet use, with much focus on pathological aspects such as depression. However, there's a growing need to explore non-pathological factors in understanding addictive behaviors. Chak and Leung (2004) noted that high-risk Internet users often struggle with self-control, potentially due

to low self-confidence and emotional issues, underscoring the importance of studying self-confidence in addiction. King, Delfabbro, and Griffiths (2011) suggested that psychological responses beyond enjoyment are key to understanding video game behavior, aligning with the uses and gratifications theory, which indicates that an individual's social and psychological traits influence their media choices and that self-confidence levels may change due to gaming (Greenberg et al., 2010).

### 2.2.3. Hypothesis 6: Internet Gaming Addiction Decreases Self-esteem. (H6)

Research shows a complex relationship between self-esteem and internet addiction. Generally, low self-esteem negatively predicts internet addiction, with individuals lacking social skills and confidence more prone to using the internet as a means of compensation and avoidance (Van Wan & Chiou, 2006a). Addicted online gamers often exhibit a negative relationship between self-esteem and psychosocial factors, with dissatisfaction driving compulsive gaming behavior (Ko et al., 2005). However, some studies suggest that gaming can boost self-esteem by providing immediate satisfaction, a sense of accomplishment, and the ability to create social identities, particularly for those with narcissistic traits or social anxieties (Olson, 2010; Stetina et al., 2011). Despite this, gaming's impact on self-esteem varies, with some findings indicating that frequent gaming negatively affects boys but not girls (Colwell, 2012). Additionally, players with low self-esteem tend to create idealized avatars, while those with high self-esteem design avatars resembling their actual selves (Bessiere, Seay, & Kiesler, 2007).

## 3. Method

### 3.1. Procedures

This study was designed as a correlational study (Creswell, 2012), enabling the researchers to assess the relationships and impacts between independent and dependent variables.

### 3.2. Aim of the Study

Existing research on internet gaming addiction is limited and primarily clinical in nature (Anand, 2007). This study aims to estimate the impact of gender, social relationship behaviors and leisure-time activities (computer gaming) on internet gaming addiction. Additionally, it investigates the effect of internet gaming addiction on academic performance, self-esteem, and self-confidence. Unlike extensive prior psychological research on this topic, this study explores the relationship between internet gaming addiction and various constructs from a psycho-sociological perspective. The study's hypotheses are illustrated in Figure 1 and are described in separate sections corresponding to the findings of previous studies.

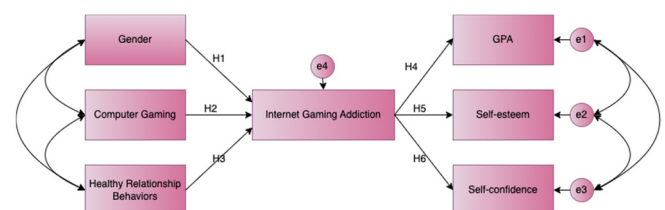


Fig 1. Hypothesized model.

### 3.3. Study Participants

The research sample was composed of 276 adolescents

studying at middle schools in Qinghai province in China. The participants' profile is presented in Table 1.

**Table 1.** Study Participants

	F	%
<b>Gender</b>		
- Female	126	45.7
- Male	150	54.3
<b>Grade</b>		
- 7	85	30.8
- 8	94	34.0
- 9	97	35.1
<b>Computer ownership</b>		
- Yes	260	94.2
- No	16	5.8
<b>Most often Leisure Activity (Computer gaming)</b>		
- Yes	225	81.5
- No		
<b>GPA</b>		
- >3.5	50	18.1
- 3.0-3.5	137	49.6
- 2.5-3.0	65	23.6
- <2.5		

### 3.4. Measures

Multiple measures were collected within a single questionnaire pack. Each measure is explained below.

**Gender:** The participants were asked to specify their gender as either male or female. Males were assigned a code of 1, while females were assigned a code of 2. A negative correlation indicates that the results favor males, and vice versa.

**Computer gaming:** This measure was determined using a multiple-choice question that asked participants how they typically spend their leisure time and do they spend most of their leisure time in computer gaming. They were allowed to choose only one option from the following: exercising, reading, playing computer games, or other options.

**Healthy relationship behaviors:** This measure evaluated participants' engagement in healthy relationship behaviors through a series of Yes or No questions. Key indicators included effective communication, respectful interaction, supportiveness, constructive conflict resolution, and commitment to maintaining positive relationships with friends, family, and professors. Participants indicated whether their behaviors aligned with these positive relationship practices across various aspects of their lives.

**Internet Gaming Addiction:** The variable was measured using the Addiction Engagement Questionnaire (AEQ), a 24-item tool with response options on a four-point scale (1 – strongly disagree; 4 – strongly agree).

**Self-esteem:** The short form of the Coopersmith Self-Esteem Questionnaire, comprising 25 items with binary response options (appropriate and not appropriate), was utilized for this measure.

**Self-confidence:** This measure was evaluated using the Self-Confidence Scale, which consists of 33 items divided into sections for internal and external self-confidence (Akin, 2007).

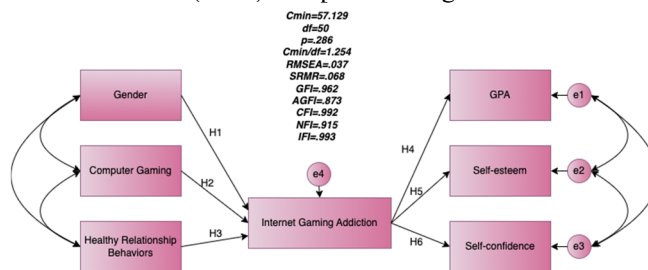
### 3.5. Data Analysis

Data were analyzed with structural equation modeling

(SEM) using SPSS. SEM allows researchers to explore intricate relationships between variables and develop comprehensive models.

## 4. Results

The hypothesized model was tested, and the standardized estimated model (SEM) is depicted in Figure 2.



**Fig 2.** Structural Equation Model Internet Gaming Addiction

The fit indices for the model, which estimates the antecedents and consequences of internet gaming addiction, are shown in Table 2. All fit values met the criteria established in the literature, confirming the model's validity.

**Table 2.** Evaluation of model fit indices

Fit index	Model value	Criteria for perfect fit
$\chi^2(50)$	57.129 $p=.286$	Low $\chi^2$ value and $p > .05$
$\chi^2/df$	1.254	$\chi^2/df < 3$
RMSEA	0.037	RMSEA < .05
SRMR	0.068	SRMR $\leq .05$ – Perfect Fit SRMR $\leq .08$ – Good Fit
GFI	0.962	$.95 \leq GFI \leq 1$
AGFI	0.873	$.85 \leq AGFI \leq 1$
CFI	0.992	$.97 \leq CFI \leq 1$
IFI	0.993	$.95 \leq IFI \leq 1$

The model revealed that computer addiction, poor relationships with friends, negative relationships with professors, and weekly Internet usage contribute to increased Internet addiction. Conversely, healthy relationships with family members, using the Internet for exercising, reading, or other uses as leisure activities were found to decrease Internet gaming addiction.

The statistical analysis of each hypothesis is detailed in Table 3. Hypotheses H1, H4, H5 were significantly confirmed, while H2, H3 and H6 were confirmed but not significantly. Insignificant associations were retained in the model due to the quality of the model fit values.

## 5. Discussion

This study aligns with previous findings that male youth are more prone to internet gaming addiction (Thomas & Martin, 2010). However, attributing behavioral problems solely to gaming, rather than underlying psychological issues, can lead to an overestimation of gaming's impact (King, Delfabbro, & Griffiths, 2011). While time spent gaming is significant, it doesn't fully capture the addiction's impact (Stetina et al., 2011), as addiction risk rises when gaming takes precedence over other activities (Rehbein et al., 2010; Grüsser et al., 2006).

**Table 3.** Statistical assessment of hypotheses

	Label in the model	Estimates	S.E.	t
Hypothesis 1: Males are more susceptible to internet gaming addiction.	H1	0.75	0.11	6.82
Hypothesis 2: Computer gaming as a leisure activity increases internet gaming addiction.	H2	0.10	0.12	0.83
Hypothesis 3: Maintaining healthy relationships with family, friends, and teachers decreases internet gaming addiction.	H3	-0.08	0.13	-0.62
Hypothesis 4: Internet gaming addiction negatively impacts academic performance.	H4	-0.70	0.14	-5.00
Hypothesis 5: Internet gaming addiction decreases self-confidence.	H5	-0.55	0.13	-4.23
Hypothesis 6: Internet gaming addiction decreases self-esteem.	H6	-0.35	0.12	-2.92

\*  $p < .05$ , \*\*  $p < .01$

Our findings emphasize the role of personal and academic relationship quality in mitigating or exacerbating gaming addiction. Healthy relationships, characterized by effective communication, respect, and support, reduce the likelihood of turning to gaming as a coping mechanism. In contrast, negative relationship dynamics, such as neglecting responsibilities and strained academic interactions, can drive individuals to seek solace in online gaming (Griffiths, 2003). Poor academic relationships or lack of support may lead individuals to the online world for control and immediate gratification.

The study also confirms that internet gaming addiction can harm academic performance and self-esteem, though previous research on these effects is mixed. Some studies link excessive gaming to poorer academic outcomes and lower self-esteem (Anand, 2007), while others find no correlation (Borzekowski & Robinson, 2005). Additionally, some research suggests complex games might enhance cognitive skills and academic performance (Olson, 2010).

The relationship between self-esteem and game addiction varies, with some studies showing negative impacts (Ko et al., 2005) and others indicating positive effects (Liu & Peng, 2008). The positive aspects may stem from game features like feedback and achievements, while problematic gaming can reduce self-esteem. Overall, while gaming can have negative effects, its benefits should be considered, and more nuanced research is needed to understand its full impact on self-esteem

and academic performance.

## 6. Conclusion

Our study indicates that internet gaming addiction is strongly associated with gender and interpersonal relationships involving peers, family, and educators. Specifically, being female and maintaining healthy relationships with these groups significantly reduces the likelihood of developing problematic patterns of internet gaming addiction. Furthermore, our findings underscore the potential consequences of excessive gaming, which can manifest in several adverse outcomes, including diminished academic performance, declining self-esteem, increased social withdrawal, and potential conflicts within personal and educational environments. These negative impacts highlight the importance of addressing internet gaming addiction through targeted interventions that consider both the social context and individual differences among adolescents.

However, our study is limited on the reliance on self-reported data, which can introduce bias and affect the validity of the findings. Future research should aim to use larger, more diverse samples to improve the generalizability of the findings. Longitudinal studies would also be beneficial to understand the long-term effects of internet gaming addiction and to establish causal relationships more clearly. Furthermore, future studies should consider the specific features of games that may contribute to addiction and its effects, as the total time spent on gaming alone may not be a sufficient indicator of its impact on adolescents' academic and psychosocial well-being.

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